

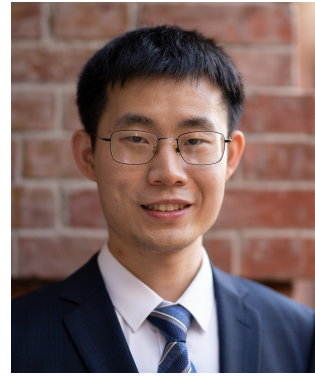
# Maosu Li

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## VISION

Apply state-of-art **3D City Information Modeling (CIM)**, **AI**, and **Big Data** to smarter **landscape management and urban planning**;

Particularly focus on **disparity of window-level visual exposure to nature and openness** to create **automatic tools and quantified evidence** for decision-making in **healthy high-rise, high-density urban development**.

## RESEARCH INTERESTS

Urban Informatics, Analytics, and Computing through i) 3D City Information Modeling, ii) Machine Learning, and iii) Data Management and Analysis.

## MAJOR RESEARCH ACHIEVEMENTS

**Systematically** create **multiple automatic assessment methods** of **window views** to **enable urban-scale** window-view research and applications in urban planning, housing, and health.

The quantified window views **open up a new track of landscape analytics, supplementing** two typical ones from street and satellite views.

The thesis (**Outstanding, Top 5% (HKU), IEEE GRSS Excellent PhD Dissertation Award (First Prize)**) systematically constructed a **theoretical framework** of window view characteristics, an **urban computing paradigm**, and three quantification and automatic **computation methods**.

On window views, Maosu's four-year Ph.D. research has:

- **Won 14 honors and awards**, e.g., Gold Medal of the 49th International Exhibition of Inventions of Geneva (2024), HKU Foundation Publication Award for Research Postgraduate Students (1/20) (2023), HKU Research Postgraduate Student Innovation Award (2023), Hong Kong Talent Development Scholarship twice (2024 and 2022), and Esri Young Scholars Award (Hong Kong) (2021);
- **Been published in 10 journal and conference papers, and 1 US/CN/PCT patent**;
- **Been applied in 3 housing and urban planning practices**, supported by HKU Estates Office, Centaline Property, and Hong Kong Urban Renewal Authority;
- **Received several recognitions from researchers and practitioners**, e.g., "groundbreaking contribution", "innovative methods", and "timely, inspiring, and commendable work" with "cutting-edge techniques";

## EDUCATION

Ph.D. Geographic Information Science (Outstanding, Top 5%), the University of Hong Kong, 2020-2024

B.Eng. Geodesy and Geomatics Engineering (First Class Honors), Southwest Jiaotong University, 2014-2018

## EMPLOYMENT

- 2025.2-present URC Post-doctoral Fellow, the University of Hong Kong
- 2024.6-2024.12 Visiting Post-doctoral Fellow, Massachusetts Institute of Technology
- 2024.2-2025.2 Post-doctoral Fellow, the University of Hong Kong
- 2021.6-2021.8 Summer Intern, Hong Kong Urban Renewal Authority

## FEATURED AWARDS

- 2024 IEEE GRSS Excellent PhD Dissertation Award (First Prize), IEEE GRSS Hong Kong Chapter.
- 2024 Talent Development Scholarship, Education Bureau of Hong Kong SAR.
- 2024 Gold Medal, 49<sup>th</sup> International Exhibition of Inventions of Geneva.
- 2024 Best Poster Presentation Award, Organizing Committee of HKU Research Postgraduate Symposium 2024, the University of Hong Kong.
- 2023 Best Conference Paper Award (First Place), Organizing Committee of Global Smart Cities Summit cum The 3<sup>rd</sup> International Conference on Urban Informatics.
- 2023 First Prize of Smart City Research and Innovation Scheme, International Society for Urban Informatics.
- 2023 HKU Foundation Publication Award for Research Postgraduate Students 2023 (1/20), Graduate School, the University of Hong Kong.
- 2023 Research Postgraduate Student Innovation Award 2022/23 (1/10), Graduate School, the University of Hong Kong.
- 2022 Second Prize (3D modeling) and Third Prize (2D CAD), Second "Scan-to-BIM" challenge, CVPR. [\[Web\]](#)
- 2022 HK-Asia-Pacific Economic Cooperation Scholarship, Education Bureau of Hong Kong SAR.
- 2022 Talent Development Scholarship, Education Bureau of Hong Kong SAR.
- 2021 Esri Young Scholars Award (Hong Kong), Environmental Systems Research Institute (Esri). [\[Web\]](#)
- 2020 Outstanding Paper Award and Merit Paper Award, Organizing Committee of 25<sup>th</sup> International Symposium on Advancement of Construction Management and Real Estate. (Li et al., 2021; Zhang et al. 2021)
- 2019 National Scholarship, Ministry of Education of the People's Republic of China. [\[Web\]](#)
- 2019 Excellent Students Award, Southwest Jiaotong University.
- 2018 Outstanding Paper Award, 2018 National Symposium on Surveying and Mapping Science and Technology.
- 2018 Mao Yisheng Gold Medal, Mao Yisheng Honor's College, Southwest Jiaotong University.
- 2018 Outstanding Graduates Award, Southwest Jiaotong University.
- 2017 SWJTU Press and Mao Yisheng Scholarship (Honorary Student Award), Southwest Jiaotong University.
- 2017 Best Paper Award, 9<sup>th</sup> National College Students' Paper Competition on Surveying and Mapping.
- 2017 'Hi-Target' Scholarship, Southwest Jiaotong University.
- 2017 University Scholarship (Special Prize), Southwest Jiaotong University.
- 2017 First Prize, 14<sup>th</sup> May Day Mathematical Modeling Competition.
- 2016 Outstanding Student Leader Award, Southwest Jiaotong University.
- 2016 University Scholarship (First Prize), Southwest Jiaotong University.

## PUBLICATIONS

### First-author Articles in Peer-Reviewed Journals

- 2025 **Li, M.,** Yeh, A. G., & Xue, F. “Efficient and accurate assessment of window view distance using city information models and 3D computer vision.” *Landscape and Urban Planning (RI revision)*. (**First Prize in Smart Cities Innovation Competition; Talent Development Scholarship**)
- 2024 **Li, M.,** Yeh, A. G., & Xue, F. “CIM-WV: A 2D semantic segmentation dataset of rich window view contents in high-rise, high-density areas based on photorealistic City Information Models.” *Urban Informatics*, 3, 1-24. (**Best Paper Award at Global Smart Cities Summit cum The 3<sup>rd</sup> International Conference on Urban Informatics**)
- 2023 **Li, M.,** Xue, F., & Yeh, A. G. “Bi-objective analytics of 3D visual-physical nature exposures in high-rise high-density cities for landscape and urban planning.” *Landscape and Urban Planning*, 233, 104714. (**Esri Young Scholars Award; Talent Development Scholarship; HK-Asia-Pacific Economic Cooperation Scholarship**)
- 2022 **Li, M.,** Xue, F., Wu, Y., & Yeh, A. G. “A room with a view: Automatic assessment of window views for high-rise high-density areas using City Information Models and deep transfer learning.” *Landscape and Urban Planning*, 226, 104505. (**Gold Medal of Geneva Exhibition; HKU Foundation Publication Award; Best Poster Presenter Award; Research Postgraduate Student Innovation Award**)
- 2022 **Li, M.,** Peng, Y., Wu, Y., Xu, J., Tan, T., Guo, H., ... & Xue, F. “Role of the built environment in the recovery from COVID-19: Evidence from a GIS-based natural experiment on the city blocks in Wuhan, China.” *Frontiers in Built Environment*, 7, 813399.

### Co-author Articles in Peer-Reviewed Journals

- 2025 Meng, S., Su, X., Sun, G., **Li, M.,** & Xue, F. “From 3D pedestrian networks to wheelable networks: An automatic wheelability assessment method for high-density urban areas using contrastive deep learning of smartphone point clouds.” *Computers, Environment and Urban Systems*, 117, 102255.
- 2024 Wang, B., **Li, M.,** Peng, Z., & Lu, W. “FaçadeGraph: A hierarchical attributed graph-based generative façade parsing approach for high-rise residential buildings.” *Automation in Construction*, 164, 105471.
- 2024 Wu, Y., Xue, F., **Li, M.,** & Chen, S. “A novel building section skeleton for compact 3D reconstruction from point clouds: A study of high-density urban scenes.” *ISPRS Journal of Photogrammetry and Remote Sensing*, 209, 85-100.
- 2023 Yuan, L., Lu, W., Xue, F., & **Li, M.** “Building feature-based machine learning regression to quantify urban material stocks: A Hong Kong study.” *Journal of Industrial Ecology*, 27, 336-349.
- 2020 Zhu, Q., Chen, M., Feng, B., Zhou, Y., **Li, M.,** Xu, Z., ... & Xie, X. “Optimized spatiotemporal data scheduling based on maximum flow for multilevel visualization tasks.” *ISPRS International Journal of Geo-Information*, 9 (9), 518.
- 2020 Zhu, Q., Feng, B., **Li, M.,** Chen, M., Xu, Z., Xie, X., ... & Feng, Y. “An efficient sparse graph index method for dynamic and associated data.” *Acta Geodaetica et Cartographica Sinica*, 49 (6), 681-691 (*in Chinese*).
- 2020 Zhu, Q., **Li, M.,** Ding, Y., Feng, B., Zhang, J., Cao, Z., Qiu, L., & Yin, H. “Multi-level semantic retrieval method for landslide disaster data.” *Journal of Southwest Jiaotong University*, 55 (3), 467-475 (*in Chinese*).

### Conference Proceedings

- 2025 **Li, M.\***, Xue, F., & Yeh, A. G. “Accurate assessment of human-perceived window view openness using city information models and visual AI.” *2025 Proceedings of the 19<sup>th</sup> International Conference on Computational Urban Planning and Urban Management (Accepted)*, 1-4.

- 2023 **Li, M.\***, Yeh, A. G., & Xue, F. “HRHD-HK: A benchmark dataset of high-rise and high-density urban scenes for 3D semantic segmentation of photogrammetric point clouds.” *2023 Proceedings of the 29<sup>th</sup> IEEE International Conference on Image Processing*, 3714-8. IEEE.
- 2023 **Li, M.\***, Xue, F., & Yeh, A. G. “Efficient assessment of window views in high-rise, high-density urban areas using 3D color city information models.” *2023 Proceedings of the 18<sup>th</sup> International Conference on Computational Urban Planning and Urban Management*, 1-II. OSF.
- 2023 Wu, Y., **Li, M.**, & Xue, F. “Towards fully automatic Scan-to-BIM: A prototype method integrating deep neural networks and architectonic grammar.” *Proceedings of the 2023 European Conference on Computing in Construction and the 40<sup>th</sup> International CIB W78 Conference*, 1-8. European Council on Computing in Construction.
- 2021 Laovisutthichai, V., **Li, M.\***, Xue, F., Lu, W., Tam, K. L., & Yeh, A. G. “CIM-enabled quantitative view assessment in architectural design and space planning.” *2021 Proceedings of the 38<sup>th</sup> International Symposium on Automation and Robotics in Construction*, 65-72. International Association for Automation and Robotics in Construction.
- 2021 **Li, M.\***, Xue, F., Yeh, A. G., & Lu, W. “Classification of photo-realistic 3D window views in a high-density city: The case of Hong Kong.” *Proceedings of the 25<sup>th</sup> International Symposium on Advancement of Construction Management and Real Estate*, 1339-1350. Springer.
- 2021 Zhang, J., **Li, M.**, Zhang, W., Wu, Y., & Xue, F. “Prospect of architectonic grammar reconstruction from dense 3D point clouds: Historical building information modeling (HBIM) of Guangdong cultural heritages.” *Proceedings of the 25<sup>th</sup> International Symposium on Advancement of Construction Management and Real Estate*, 1421-1431. Springer.

## Patents

- 2021 Yeh, A. G., **Li, M.**, & Xue, F. *System and methods for quantifying and calculating window view openness indexes*. PCT/United States patent PCT/CN2023/077947, US 63/269,891, WO 2023/179296 A1.
- 2019 Zhu, Q., Feng, B., Chen, M., **Li, M.**, Ding, Y., & Zhu, J. *A scheduling method, device, and storage medium for scene data of natural resources*. Chinese patent CN110516119A.

## RESEARCH PROJECTS

- 2023-24 Assessing Human-perceived Window View Openness in High-rise High-density Cities: An Automatic Machine Learning-based City Information Modeling Approach, HKU Leung Kau Kui and Run Run Shaw Research and Teaching Endowment Funds, HKD 50,000, Primary Investigator.
- 2023-25 From 3D Real Scene to 3D Semantics: Reconstruction of Semantic Volumetric Building Models using 3D Skeletons in Urban Point Clouds, Natural Science Fund of Guangdong Province, RMB 100,000, Co-Investigator.
- 2023-25 Scan-to-BIM Automation System for Built Assets Digitization in Hong Kong, Hong Kong Innovation and Technology Fund, HKD 7,510,000, Co-Investigator.

## TEACHING EXPERIENCE

- 2022 Course tutor, URBP7003 Research Methods in Spatial Planning, the University of Hong Kong.
- 2021 Course tutor, URBP7003 Research Methods in Spatial Planning, the University of Hong Kong.

## ACADEMIC TALKS

- 2024 Invited talk, “Quantification and Automatic Computation of 3D Window Views in High-rise, High-density Cities Based on City Information Models and Machine Learning.” *Annual Workshop of the*

- IEEE GRSS Hong Kong Chapter cum the 2nd Young Innovation Forum on Digital Earth*. Hong Kong SAR, China. December 6.
- 2024 Invited talk, “Does any nature exposure in a city matter equally? A multi-dimensional nature exposure study on well-being: the case of Tokyo, Japan.” *2024 Senseable Forum on Future Cities*. Boston, United States. November 21.
- 2024 Invited talk, “Automatic assessment of window view distance for high-rise, high-density areas using city information models and 3D computer vision and graphics.” *3<sup>rd</sup> International Conference on Geoinformatics*. Toronto, Canada. August 14.
- 2023 Invited talk, “HRHD-HK: A benchmark dataset of high-rise and high-density urban scenes for 3D semantic segmentation of photogrammetric point clouds.” *2023 IEEE International Conference on Image Processing*. Kuala Lumpur, Malaysia. October 8.
- 2023 Invited talk, “CIM-WV: A 2D semantic segmentation dataset of rich window view contents in high-rise, high-density areas based on photorealistic City Information Models.” *3<sup>rd</sup> Global Smart Cities Summit cum The 3<sup>rd</sup> International Conference on Urban Informatics*. Hong Kong SAR, China. August 23.
- 2023 Invited talk, “Efficient assessment of window views in high-rise, high-density urban areas using 3D color city information models.” *18<sup>th</sup> International Conference on Computational Urban Planning and Urban Management*. Montreal, Canada. June 21.
- 2023 Winner’s talk, “Automatic Assessment of Window View Distance for High-rise, High-density Areas using 3D Color CIMs.” *Smart Cities Innovation Competition, International Society for Urban Informatics*. Hong Kong SAR, China. January 13. [\[Web\]](#)
- 2022 Winner’s talk, “Floor layer-based kernels and pillars of points (FLKPP): 3D building model reconstruction.” *2<sup>nd</sup> Workshop and Challenge on Computer Vision in the Built Environment for the Design, Construction, and Operation of Buildings, CVPR 2022*. New Orleans, USA. June 19. [\[Web\]](#)
- 2021 Invited talk, “Exposure to nature in high-rise high-density cities: bi-objective analytics of 3D visual-physical nature accessibility for landscape and urban planning.” *HKU/PKU-SZ Joint Doctoral Colloquium on Smart Cities Analytics*. Shenzhen, China. November 27. [\[Web\]](#)
- 2021 Plenary talk, “CIM-enabled quantitative view assessment in architectural design and space planning.” *38<sup>th</sup> International Symposium on Automation and Robotics in Construction*. Dubai, UAE. November 3. [\[Web\]](#)
- 2021 Winner’s talk, “Save people from the concrete barriers: Integrated assessment of visual and physical accessibility to nature in 3D cities.” *Webinar on “GIS Applications”*. City Gallery and Planning Department. Hong Kong SAR, China. August 26. [\[Web\]](#)
- 2021 Winner’s talk, “Save people from the concrete barriers: Integrated assessment of visual and physical accessibility to nature in 3D cities.” *Seminar on Spatial Analytics*. Urban Renewal Authority. Hong Kong SAR, China. June 29.

## COMMUNITY SERVICE

- 2020-23 Research Advisor, Residential Academic Advising System (RAAS), Lap-Chee College, the University of Hong Kong.
- 2020-21 Committee Member, New Urban Researchers’ Seminar Series (NURSS) Organizing Committee, Department of Urban Planning and Design, the University of Hong Kong.
- 2017 Vice President, Mao Yisheng Honor’s College Students’ Union, Southwest Jiaotong University.

## MEDIA COVERAGE

- 2025 IEEE GRSS Excellent PhD Dissertation Award (First Prize), *MIT Senseable City Lab Newsletter*. Massachusetts Institute of Technology. [\[Web\]](#)

- 2024 Gold Medal, 49<sup>th</sup> International Exhibition of Inventions of Geneva *HKU Press Releases*. The University of Hong Kong. [\[Web\]](#)
- 2023 HKU Research Postgraduate Student Research Innovation Award, *HKU Annual Report 2023*. The University of Hong Kong. [\[Web\]](#)
- 2023 First Prize in ICUI Smart Cities Innovation Competition, *the Graduate School Newsletter*. The University of Hong Kong. [\[Web\]](#)
- 2023 Scan-to-BIM Prizes, 26<sup>th</sup> *Recognition Ceremony*. CEDARS, the University of Hong Kong. [\[Web\]](#)
- 2022 Esri Young Scholars Award, 25<sup>th</sup> *Recognition Ceremony*. CEDARS, the University of Hong Kong. [\[Web\]](#)
- 2021 PhD student wins young scholars award in geospatial sciences, *the Graduate School Newsletter* (Cover). The University of Hong Kong. [\[Web\]](#)
- 2021 A new angle on views, *The University of Hong Kong Bulletin*. [\[Web\]](#)
- 2021 How 3D spatial information brings people closer to nature, *Hong Kong Economic Journal*. [\[Web\]](#)

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